DEPARTMENT OF THE AIR FORCE
WASHINGTON DC 20330-1000

25 FEB 2002

OFFICE OF THE SECRETARY

SAF/LL
1160 Air Force Pentagon
Washington, DC 20330-1160

The Honorable Bob Stump
Chairman, Committee on Armed Services
House of Representatives
Washington, DC 20510-6035

Dear Mr. Chairman

The Floyd D. Spence National Defense Authorization Act of Fiscal Year 2001 requires the Air Force to submit to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives a report on the roles and missions, organizational structure, funding, and operations of the Air Force Institute of Technology (AFIT) as projected through 2010.

The completed report is attached. AFIT continues to be an important and unique Air Force asset, and plays a vital role in keeping the Air Force the most technologically advanced and powerful aerospace force on Earth.

Copies of the report are being provided to the Ranking Minority Member of the Committee, the Chairman and Ranking Minority Member of the Senate Armed Services Committee, Senators DeWine and Voinovich and Representatives Hall and Hobson.

Very Respectfully

LEROY BARNIDGE, JR
Major General, USAF
Director, Legislation Liaison

Attachment:
AFIT Report

REPORT

ON

AIR FORCE INSTITUTE OF TECHNOLOGY (AFIT)

STUDY

FOR

SENATE AND HOUSE ARMED SERVICES COMMITTEES

DUE: 30 September 2001

Introduction:

This report was written to meet the requirements of the National Defense Authorization Act (NDAA) of 2001, which tasked the Air Force (AF) with a study of AFIT. The NDAA mandated the following items be included in the report:

1) A statement of the institute's roles and missions through 2010 in meeting the critical scientific and educational requirements of the AF
2) A statement of the strategic priorities for the institute in meeting long-term core science and technology educational needs of the AF
3) A plan for the near-term increase in the production by the institute of master's and doctoral degree graduates

The report also includes recommendations on:

1) The grade of the Commandant of AFIT
2) The chain of command of the Commandant within the AF
3) Employment and compensation for the institute's civilian professors
4) The process for identifying AF requirements for personnel with advanced degrees
5) The institute's candidate-selection process for annual enrollment
6) Post-graduation opportunities within the AF for AFIT graduates
7) AFIT admission policies and practices for Army, Navy, Marine Corps, and Coast Guard officers; employees of the Department of the Army; Department of the Navy; Department of Transportation; foreign military personnel; enlisted members of the Armed Forces; and other persons eligible for admission
8) Near- and long-term funding of the institute
9) Opportunities for cooperation, collaboration, and joint endeavors with other military and civilian scientific and technical educational institutions for the production of qualified personnel to meet Department of Defense scientific and technical requirements

The report consists of an executive summary and chapters addressing the specific issues above.

The lead agency and focal point for the AF for this report is the Office of the Secretary of the AF (HQ USAF/OS): Headquarters Air Force, 1670 Air Force Pentagon; Washington DC 20330-1670. The phone number is (703) 697-7376 or DSN 227-7376. The report has been reviewed and approved by the Commander of the Air Force Materiel Command as required by NDAA 2001.

TABLE OF CONTENTS

CHAPTER and TITLE

EXECUTIVE SUMMARY

This executive summary outlines the chapters found in the Report on Air Force Institute of Technology (AFIT) Study for Senate and House Armed Services Committees. This report was written to meet the requirements of the National Defense Authorization Act (NDAA) of 2001, which tasked the Air Force with a study of AFIT. The objective of the report is to highlight AFIT's roles and missions, strategic priorities, plans to increase production, recommended organizational structure, student selection process, opportunities for graduates, funding issues, opportunities for research, and future challenges. The report contains 11 chapters with each chapter addressing a specific issue or providing a recommendation as requested in the NDAA of 2001. The chapters are titled according to the issue addressed.

Chapter 1 examines AFIT's roles and missions through 2010, focusing primarily on meeting the United States Air Force (USAF) and Department of Defense (DoD) critical scientific and education requirements. The overall mission of AFIT is to provide responsive, defense-focused graduate and professional continuing education; mission-focused research and worldwide problem solving for the USAF and DoD; and technical consultation to improve USAF and joint operations capability. AFIT's mission includes ensuring that the AF is able to maintain its scientific and technological dominance. AFIT has derived its direction from a wide variety of AF and joint publications in order to develop educational and research programs. This has allowed AFIT the flexibility to adapt scientific and technical research and tailor its education programs in response to a rapidly changing world. In the future, AFIT will work to establish a relationship with the Naval Postgraduate School to capitalize on the strengths of both programs to jointly improve graduate education opportunities for both Services.

Chapter 2 delineates the strategic priorities of AFIT. AFIT's strategic priorities reflect its mission: to provide responsive, defense-focused graduate and professional continuing education to meet the needs of the USAF, DoD and the Nation; conduct mission-focused research and worldwide problem solving for the USAF and DoD; and provide technical consultation to improve AF and joint operational capability.

Chapter 3 identifies USAF initiatives to increase enrollment in the graduate degree programs at AFIT and summarizes the difficulties AFIT has encountered in filling scientific and engineering student requirements. Initiatives include: utilizing direct accessions from the officer commissioning sources to fill seats; allowing military personnel and federal civilians in the Wright-Patterson Air Force Base area to enroll; and identifying and recruiting international officers to fill remaining available seats. . These actions have raised the core engineering and science student fill-rate to over 80 percent, up from below 50 percent. It has also resulted in the first AFIT resident enrollment increase since 1995 when the demand for scientists and engineers was not as high. The failure to meet a 100-percent fill-rate appears to be one consequence of current personnel shortages in the science and engineering career fields throughout the USAF. Current manning in scientific fields is 80 percent and 68 percent within the developmental engineering career field. Meeting a 100 percent student fill-rate in the engineering and science field of study would negatively impact present AF missions including operations tempo. Efforts to publicize opportunities to attend AFIT to encourage additional volunteers have been marginally successful. In addition, some personnel appear to be reluctant to commit to additional active duty service in a full-employment economy with better salaries outside the Air Force.

Chapter 4 addresses the recommended grade of the AFIT Commandant. The methodology used is the Position Description (PD). The rank of the AFIT Commandant is therefore based upon the level and scope of responsibilities, the experience and skills required to do the job, and the level of official contacts with whom the commandant interacts. Using this methodology, the grade of the AFIT Commandant grades out at the level of brigadier general. The PD supports this by outlining the required specific duties and skills of the commandant. The current incumbent is a colonel and that has been the grade of the AFIT Commandant since 1991.

Chapter 5 depicts AFIT's current chain of command, which consists of four levels. Presently, AF reports to the Air University (AU) Commander who subsequently reports to Air Education and Training Command (AETC). The AETC Commander reports directly to Headquarters Air Force. The study supports the current command arrangement.

Chapter 6 focuses on AFIT's civilian faculty employment, civilian faculty pay and associated problems. The chapter discusses AFIT's quest to remain competitive with other public and federal institutions in terms of faculty pay. During the threatened closure actions in the mid-1990s, AFIT lost 20 of the graduate school's 51 civilian faculty members to retirement or other civilian job opportunities. Ten of these vacancies remain unfilled. In filling its vacancies, AFIT is statutorily restricted to hiring only US citizens. This limits their pool of eligible applicants and affects AFIT's ability to hire qualified faculty. It is estimated that 45 to 60 percent of doctorates earned in engineering and the physical sciences in the past decade were awarded to non-US citizens. AFIT must try to hire from a pool of less than 50 percent of those earning doctorates. Another problem that AFIT continues to confront is the perception that the school may close in the future despite assurances from both senior Air Force leadership and Congress that AFIT's future is secure.

Chapter 7 explains the process for identifying USAF requirements for personnel with advanced academic degrees and the identification and selection of candidates for annual enrollment at AFIT. USAF career functional managers identify requirements for specific duty positions, which require an Advanced Academic Degree (AAD). AAD positions are the basis of the USAF-funded graduate education program. An AAD-validated position indicates the incumbent cannot optimally perform the job without the specific advanced degree. The basis for USAF AAD-funded quota requirements is projected vacancies due to personnel rotations or new degree requirements. If the USAF cannot fill the mission critical positions with the current officer inventory, then a limited number of officers are selected to receive graduate education through in-resident attendance at AFIT or a civilian institution. Current USAF policy requires the student attend AFIT if the field of study is available in residence. Graduates of the funded graduate education program normally serve in a coded AAD position immediately following graduation to ensure optimal payback to the Air Force. However, by regulation they must serve in an AAD position no later than the second tour following completion of the funded education. Due to funding constraints, the requirements for graduate education always exceed the number of available slots. The Air Force Education Requirements Board (AFERB) Working Group, a panel of career field functional experts, prioritizes the USAF graduate education requirements to determine which slots are funded with the limited resources. The AFERB Executive Committee reviews the working group's findings and validates or modifies the results as necessary. The AFERB normally meets each October one and a half years prior to execution year for graduate education requirements, allowing time for candidate selection and preparation for the following

summer move cycle. The Air Force Personnel Center (AFPC) selects the most qualified candidates available for the graduate degree training. Time-on-station requirements should be met to ensure personnel are not moved too often and to ensure the Air Force gets adequate payback for the previous move. Additionally, USAF mission requirements take priority further reducing the pool of eligible candidates. Also, some members might be reluctant to accept the active duty service commitment associated with the training in light of the competitive civilian job market. In summary, the USAF has a formal system in place to ensure limited graduate education resources are used to the maximum benefit of the USAF, DoD and the Nation. The AF selection process in determining AAD positions and filling AADs prevents repetition of effort in meeting AF needs.

Chapter 8 discusses the post graduation opportunities (within the USAF) for AFIT graduates. These opportunities are in areas related to the graduate's degree and involve jobs requiring an advanced degree in which the officer is a specialist. Sanctioned by the CSAF and SECAF, the S&E Summit is working to define better career opportunities for the science and engineering career fields to enhance recruitment and retention of scientists and engineers. The S&E Summit is examining the officer scientist and engineer career path where these officers could remain on a technical career path and be competitive for promotion to higher grades.

Chapter 9 illustrates the policies and practices of admitting Army, Navy, Marine Corps, and Coast Guard officers, Department of the Army, Navy, and Transportation employees, military personnel from foreign countries, enlisted members and other persons eligible for admission to AFIT. AFIT follows the same policies and practices for applicants from other sources as it does for USAF officers. However, AFIT only enrolls non-USAF students on a space-available basis, since AFIT's priority is to educate AF quota students. These exceptions are beyond AFIT's control and while they do not affect admission criteria, they do affect the space available for these students. Students from non-USAF sources such as sister services and foreign military personnel have been used to fill vacant seats at AFIT and ensure the institute is operating efficiently. Students from outside sources currently make up almost a third of AFIT's total student in-resident population. In the past, this has not been a problem since the USAF was unable to fill the quotas; however, if the USAF reaches a point where it can fill all the student slots, additional funding will be required to accommodate non-AF students. AFIT prefers to admit a number of sister service and foreign military officers to promote jointness, develop better relationships with international partners, and ensure continued interest in the programs. This chapter discusses a complication encountered when admitting civilians. Funds paid by civilians taking AFIT courses are deposited directly in the US Treasury and AFIT receives no direct reimbursement. Dayton Area Graduate Studies Institute (DAGSI) students who participate in a Cooperative Research and Development Agreement (CRDA) are an exception. DAGSI is a consortium of universities in the Dayton, OH area that allow the transfer of credits between the participating universities. This program allows payment to DAGSI, which deducts an administration fee and forwards the balance of the money to the providing institute. The chapter concludes by noting there is no reason why academically qualified enlisted personnel could not attend AFIT as full-time students.

Chapter 10 addresses the near- and long-term funding of AFIT. AFIT's funding has remained constant over recent years while overall requirements and costs continue to increase. Over the last 5 years, requirements have exceeded funding from $4M to $8M annually. This trend in funding is

typical of the budget shortfalls each service has experienced. The long-term funding shortfalls from FY 03-09 are estimated to be between $11M and $20M.

Chapter 11 examines opportunities for joint research and collaborative endeavors with other military and civilian scientific and technical institutions in order to produce qualified personnel to meet DoD scientific and technical requirements. In the past, AFIT has successfully identified and benefited from joint research efforts with other USAF agencies. From FYs 97-00, the AF Research Laboratory (AFRL) and the AF Office of Scientific Research (AFOSR) provided over 70 percent of the funding for joint research and collaborative endeavors with AFIT, an amount ranging from $3.1M to $4.5M. Other USAF agencies contributed over $750,000 annually during this time. AFIT has supported other DoD units, but not to the same extent as the joint research provided to USAF units. Other DoD-sponsored research has averaged almost $250,000 each year. Other federal agencies outside of DoD, such as the Department of Energy and the National Security Agency have provided over $300,000 in research funds. Until recently, opportunities for joint research outside of the federal government have been limited. The advent of DAGSI and the associated CRDA has allowed joint research outside of the government. Civilian institute-sponsored research has climbed from less than $100,000 each year in FYs 97-99 to $255,291 last year and is expected to exceed $1M in FY 01. Building on the success with DAGSI, AFIT is now working to develop similar arrangements with educational institutions located throughout the country. One remaining barrier to collaborative efforts is the fact that AFIT is not statutorily authorized to receive grants and must negotiate other funding transfer mechanisms with sponsors. This statutory restriction was eliminated for the military academies through the Strom Thurmond National Defense Act of FY 99 and the removal of this restriction would benefit AFIT if similar legislation were enacted.

CHAPTER ONE

Statement of the Institute's Roles and Missions Through 2010 in Meeting the Critical Scientific and Educational Requirements of the Air Force

The institute's mission is "to provide responsive, defense-focused graduate and continuing education, mission-focused research and worldwide problem solving, and technical consultation to improve AF and joint operational capability."[1] Within AFIT, the Graduate School of Engineering and Management has the primary responsibility for meeting the USAF's requirements in scientific and engineering education. The graduate school's mission is "to produce graduates and research that enable the AF to maintain its defense-related scientific and technological dominance."[2] Supporting both the AF and DoD organizations with operationally focused research and consultation on scientific and technical problems is integral to the graduate school's mission.

AFIT has developed its requirements from its own educational and research programs and a wide variety of official sources including:

- The Chairman, Joint Chiefs of Staff's strategic vision statements, including *Joint Vision 2020*, and its predecessors;
  The AF's strategic vision statements including *Vision 2020: America's Air Force* and its predecessors;
  Other AF-level planning documents including "1998 Air Force Long-Range Strategic Plan";
  Official advisory panel studies including the Air Force Scientific Advisory Board's 15-volume, "*New World Vistas: Air and Space Power for the 21st Century*";
  AFIT faculty members' participation in Air University alternative future operational environment studies including "Spacecast 2020" (SECAF study completed in the early 1990s) and "Air Force 2025" (Chief of Staff follow-on study conducted in the mid-1990s);
  AF major commands' (MAJCOM) strategic plans;
  Air Force Research Laboratory technology area plans;
  Current joint and AF doctrine publications; and
  AFIT contacts with AF and other DoD organizations, especially concerning long-range education and research priorities.

These sources provide AFIT with an informed view of the potential environments for future AF operations and the technology necessary for successful military operations. In keeping with its mission, AFIT focuses its research and education programs to support both current and future AF and other DoD technology needs. AFIT's strategic focus extrapolates and supports concepts developed from the previously identified source document mission statements. These mission statements allow Air Education and Training Command (AETC), Headquarters Air University (HQ AU), and AFIT the flexibility to adapt to a rapidly changing technological environment.

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[1] Source: AFIT's current organizational mission statement.
[2] Source: The graduate school's current organizational mission statement.

AFIT will continue to identify future AF and DoD needs in curricula development, research and consultation efforts. For instance, AFIT's research efforts have kept pace with emerging scientific and technological trends. AFIT has also built appropriate support curricula in state-of-the-art fields including information operations and space operations.

The Air Force envisions joint cooperation and collaboration with the Navy in the rationalization of AFIT and Naval Postgraduate School (NPS) programs. Both schools will look at the programs to capitalize on the strengths of each, eliminate unnecessary redundancy, and develop a collaborative effort to provide enhanced educational opportunities to members of all services. We anticipate this effort will result in centers of excellence being identified and capitalized on to improve the graduate education systems of both Services.

CHAPTER TWO

Statement of Strategic Priorities for the Institute in Meeting Long-Term Core Science and Technology Educational Needs of the Air Force

AFIT's strategic priorities reflect the institute's mission identified in Chapter 1. The strategic priorities are to:

Provide responsive, defense-focused graduate and continuing education to meet the needs of the AF, DoD and the Nation;

2. Conduct mission-focused research and provide worldwide scientific and technical problem solving for the AF and DoD;

3. Provide technical consultation to improve AF and joint operational capability.

AFIT takes every opportunity to validate, affirm, and revise their curricula to meet AF long-term science and technology educational requirements. Through collaborative efforts with the Navy and NPS, AFIT plans to optimize educational opportunities.

CHAPTER THREE

Plan for Near-Term Increase in the Production by the Institute of Master's and Doctoral Degree Graduates

Over the last year the USAF has worked to increase the number of AFIT resident students for the academic school year beginning in August 2001. In July 2000, then SECAF, Honorable F. Whitten Peters, sent a letter to members of the Ohio Congressional delegation, Senators Dewine and Voinovich and Congressmen Hall and Hobson, stating the AF's commitment to working a short-term initiative to boost enrollment at AFIT. The SECAF and CSAF, General Michael Ryan, subsequently approved sending direct accessions to AFIT for critical scientific and engineering requirements. Direct accessions are those AF officers newly commissioned through Air Force Reserve Officer Training Corps (AFROTC), the United States Air Force Academy (USAFA), and Officer Training School (OTS). The SECAF did this as part of a broader effort to address the current AF science and engineering shortfall and to make better use of AFIT assets.

As a result of the commitment to fill available AFIT seats, additional quotas were allotted to AFIT for direct accessions during the February 2001 AF graduate education quota reallocation process. The AFIT Registrar identified 29 direct accessions for in-resident attendance of the graduate school in the critical engineering and scientific programs.

The Air Force Personnel Center (AFPC) centrally manages new officer accessions and their assignments are coordinated with individual Career Field Functional managers to meet Force Planning Objectives. The Developmental Engineering (AF Specialty Code 62E) Officer Assignments section at AFPC filled initial Air Staff-approved AFIT slots as top priority. However, these additional quotas given to AFIT for direct accessions exacerbate the engineering manning problem in the field since these individuals will no longer be available for operational assignments while completing their degree requirements. With this shortfall in company grade officers, the number of direct accessions sent to AFIT had to be limited. The original direct accessions goal was 50 officers. The final number of 29 was a necessary compromise between the mission needs in the field and the need to fill AFIT seats.

AFIT is filling its logistics and acquisitions seats. Since 1995, AFIT's logistics and acquisition capacity has been exceeded by an average of 10-40 percent. It is in the hard-core sciences that the seats have been difficult to fill. For example, the aeronautical and electrical engineering seat fill-rate has been less than 50 percent (25 of 52 seats filled); the physics seat fill-rate has been 30 percent (4 of 14 seats filled). The USAF is focusing its efforts in these difficult-to-fill specialties to increase AFIT's enrollment up to capacity (230 masters and 35 doctorates). The minimum efficient load has been identified as 165 masters and 22 doctorate degrees.

To fill the "hard-to-fill" degree areas, AFIT has opened their doors to all military world wide and those federal civilians stationed at Wright-Patterson Air Force Base. These students attend on a part-time basis. This has resulted in an additional ten aeronautical engineers and seven electrical engineers, as well as increases in the computer sciences, materials sciences, space engineering, and space operations programs. Over the past year, a total of 40 employees took advantage of this program.

Most of the employees are from the research labs at Wright-Patterson Air Force Base, attending AFIT as their work schedule allows. Seat fill-rates are improving – from under 50 percent to over 80 percent for FY 01. This is due to the direct accessions, Wright-Patterson part-time programs, and close oversight ensuring students attended AFIT in residence when training was available at AFIT. In addition, AFIT has been added to the list of schools that civilians can choose from under the Civilian Competitive Development Program to encourage full time participation by civilians.

To ensure that AFIT faculty is productively employed and the institute remains viable, AFIT has identified and recruited international officers. The total number of international officers in this year's 2001 graduating class and the 2002 class is 63.

In the past year, the number of in-residence students has risen 50 percent from 143 to 210 master's candidates. This represents the first AFIT in-resident enrollment increase since 1995 when scientists and engineers were not in such short supply. Other recruitment efforts, including advertising campaigns highlighting AFIT research opportunities and the specific degree programs available, have been publicized throughout the AF, but with marginal success. A primary reason cited is a reluctance to accept the additional active duty service commitment in a full-employment economy and better salaries outside the Air Force. In the coming year, the AF will continue to optimize the student fill-rate while balancing known operational requirements.

In addition, AFIT plans to work with the Navy and NPS to identify more opportunities for cross flow education between the institutions as well as additional opportunities for Naval officers and AF officers to attend sister service's programs.

CHAPTER FOUR

Recommended Grade of the Commandant of AFIT

The required grade of the commandant was determined based on the level of supervision, the scope of responsibilities, the nature of official contacts the commandant is required to make, and the experience required for the job. The Air University Manpower Division (HQ AU/XPM) developed the resultant position description (PD) for the AFIT Commandant. The PD grades out at the level of brigadier general.

AIR FORCE INSTITUTE OF TECHNOLOGY (AFIT)

COMMANDER MILITARY GRADE REQUIREMENT

POSITION DESCRIPTION

REQUIRED GRADE: Brigadier General

CURRENT AUTHORIZED AND ASSIGNED GRADE: Colonel

For 41 of 51 years, a general officer has commanded the institute. A history summary of the institute's grade assignments follows:

Major General	from April 1950	to January 1951
Brigadier General	from January 1951	to October 1951
Major General	from October 1951	to August 1957
Brigadier General	from August 1957	to September 1961
Major General	from September 1961	to June 1983
Brigadier General	from June 1983	to July 1985
Major General	from July 1985	to August 1986
Brigadier General	from August 1986	to May 1991
Colonel	from May 1991	to present

POSITION DESCRIPTION:

I. OVERVIEW:

1. **POSITION TITLE:** Commandant, AFIT
2. **RATER POSITION AND GRADE:** Commander, Air University; Lieutenant General
3. **ADDITIONAL RATER POSITION AND GRADE:** Not Applicable
4. **PRINCIPAL SUBORDINATES:** Grades, position titles, and locations of principal subordinates.
   A. AD-28, Dean of Academic Affairs

B. AD-27, Dean, Graduate School of Engineering and Management
C. Colonel, Vice Commandant
D. Colonel, Dean, Civilian Institute Programs
E. Colonel, Dean, School of Systems and Logistics
F. Colonel, Dean, Civil Engineer and Services School
G. Four additional colonels and over 20 AD-25/AD-24 (GM-15 equivalent) faculty

5. REQUIRED CONTACTS:

A. Office of Secretary of Defense
B. Defense Acquisition University
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
C. United States Air Force
   1) Office of Secretary of the Air Force
   2) Chief of Staff
   3) Deputy Chiefs of Staff
   4) Directors and Staffs
D. Air Education and Training Command
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
E. Air University
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
F. Air Force Personnel Center
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
G. Air Force Materiel Command
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
H-1. Aeronautical Systems Center
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
H-2. Air Force Research Laboratory
   1) Commander
   2) Vice Commander
   3) Directors and Staffs
I. 88th Air Base Wing (Host Wing)
   1) Commander
   2) Vice Commander

J. Other Services
   1) Secretaries and Staff
   2) Chiefs of Staff
   3) Directors and Staffs
K. Local Congressional Leaders and Offices
L. Corporate/Corporate Division/Educational Institution Presidents and Officers
M. Members of National and Professional Accreditation Boards (North Central Association of Colleges and Schools and Accreditation Board for Engineering and Technology (ABET))
N. AFIT Board of Visitors
O. Civic Leaders

6. LATERAL POINTS OF COORDINATION (staff, joint, international)

A. Other Senior Service Schools
B. Naval Postgraduate School
C. Joint Chiefs of Staff and Joint Staff
D. Office of the Secretary of the Air Force – Undersecretaries
E. Air Force Reserve Chief
F. Air National Guard Director
G. Department of Defense – Undersecretaries
H. US Government Agencies
   1) State Department
   2) Defense Intelligence Agency
   3) Central Intelligence Agency
   4) National Security Agency
I. International Liaison Officers and Organizations
J. Congressional Representatives
K. ASC Commander and Vice Commander
L. AFRL Director and Deputy Director

7. RESPONSIBILITY, AUTHORITY, AND ACCOUNTABILITY:

The commandant is responsible for leadership, discipline, morale, welfare, health, and training of assigned personnel. Manages resources to meet mission requirements. Interprets directives, orders, and regulations. Formulates plans and interfaces with other agencies as required. Maintains and enforces standards.

Responsible for planning, developing, conducting, and administering the Air Force' advanced degree-granting and professional continuing education programs in technology and acquisition to approximately 18,500 military and federal civilian employees for the United States, Department of Defense, and allied governments (includes approximately 15,800 in short professional continuing education courses). Provides the Air Force a capability for technical education, research, and consultation in the advancement of aerospace power for national security.

8. RESOURCES:

The current AFIT Commandant commands 434 members of the faculty and staff (146 officers, 63 enlisted, and 225 civilians) as well as 400 resident graduate students, and over 2,300 students at 450 civilian universities and industrial locations. Responsible for fiscal resources exceeding $80M annually and for the institute's campus facilities value estimated at $29.9M, replaceable at a cost of $114.5M.

9. MOST DIFFICULT TYPE PROBLEMS:

Personnel management issues which include academic and faculty boards, selection and subsequent placement of faculty and staff, coordination of staff and mission elements. Determining budget and fiscal priorities, including user agency (Major Air Command and Department of Defense agency) requirements. Resolving issues arising from reports of inspection and review teams, the inspector general complaint system, and the civilian performance and appraisal system. Long-term planning with Air University, Headquarters Air Education & Training Command, and Headquarters United States Air Force to match resources with education requirements.

10. SUPPLEMENTAL INFORMATION:

Effectiveness depends on ability to gain cooperation of entire AFIT faculty and staff and ability to coordinate and manage sensitive, complex issues with Headquarters United States Air Force, Headquarters Air Education & Training Command and Air University.

II. JOB REQUIREMENTS:

1. SPECIAL TRAINING AND WORK EXPERIENCE:

Rated (desired) experience beneficial to integrate operational and academic requirements into increasing interdisciplinary programs. Command and/or extensive staff experience. Knowledge and experience in Department of Defense Program Operating Memorandum (POM) process. Doctorate degree in engineering, science, or management is highly desirable. Previous AFIT-sponsored program participation desired.

2. COMMUNICATIONS SKILLS:

Approves or prepares written correspondence for Air University, Headquarters Air Education & Training Command, HQ United States Air Force, and Department of Defense addresses; must be sensitive to nuances of purpose and style and responsive to Air Force, Department of Defense, congressional, and civilian inquiries and statements. Briefs distinguished visitors to include congressional leaders and their staffs; general and flag officers, secretary-level civilians, senior-level educators, school, and staff agencies.

3. JUDGMENT AND DECISION MAKING:

Evaluates Air Force education needs, available resources to accomplish AFIT's mission and the mismatch of requirements and resources available; then determines the best short-term and long-term courses of action for most cost-effective benefit. Determines internal operating policies and procedures; evaluates and selects proposed programs and actions based on justifications, requirements, and alternatives; directs activities based on long-range plans and foreseeable objectives.

4. **PLANNING:**

Manages programming in response to changing Air Force and Department of Defense educational objectives, requirements and directions. Must be aware of changing technology and force structure to integrate AFIT's educational mission into the needs of the educational requirements plan, AFIT long-range master plan, and each AFIT school and directorate long-range plan.

5. **MANAGEMENT:**

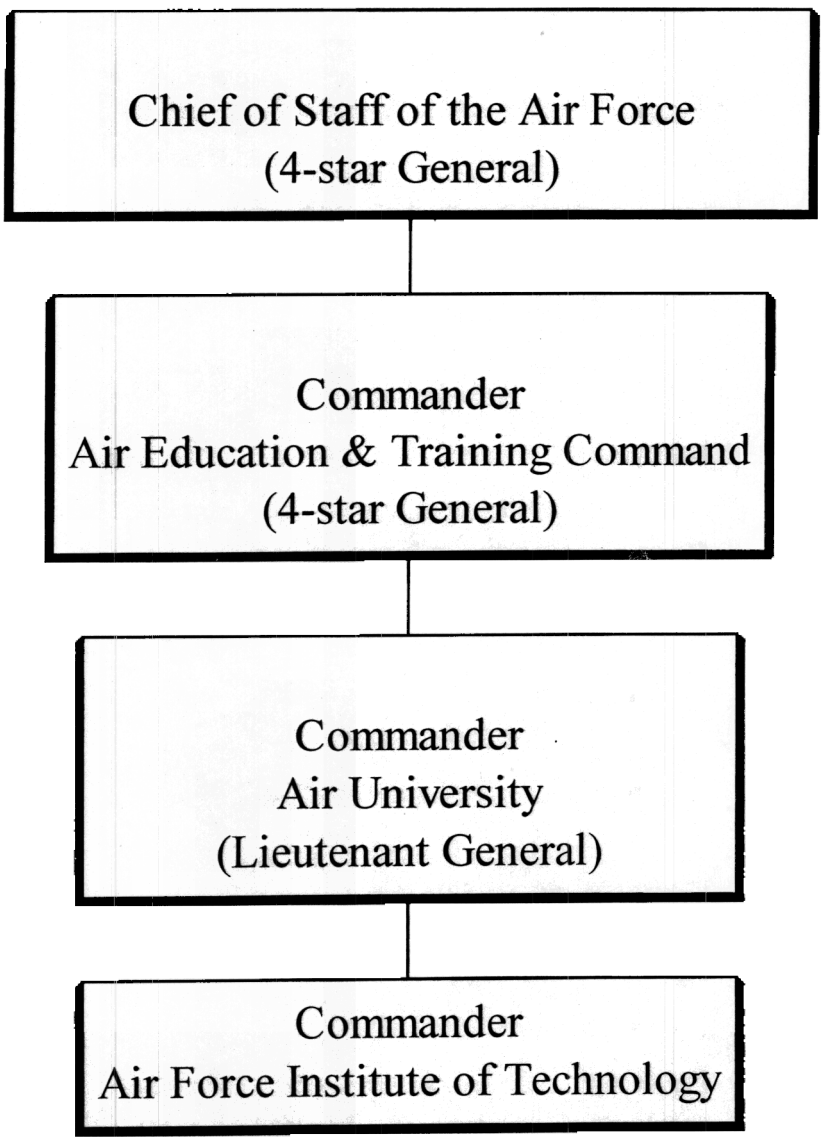
Organizes and coordinates inputs from the school deans, staff directorates, and other organization elements. Sets priorities to accomplish programs and actions; selects key staff members; guides responses to and interprets directions from higher headquarters and implements resultant policies and procedures. Responsible for signing the replies and requests for assistance to Air University, Headquarters Air Education & Training Command, Headquarters United States Air Force, and other government and civilian institutions.

CHAPTER FIVE

The Chain of Command of the Commandant within the Air Force

The existing chain of command chart is shown below:

AFIT CHAIN OF COMMAND



The six mission areas of Air University are:

. Professional Military Education.

2. Degree-Granting Education.

3. Citizenship Education.

4. Accessions Education.

5. Professional Continuing Education.

6. Research and Consultation.

AFIT's missions consist of:

1 Graduate Education (captured under degree-granting education).

2. Professional Continuing Education (under AU).

3 Mission-Focused Research and Worldwide Problem Solving and/or Consultation.

AFIT's mission is captured under Air University's missions. In addition, the rank structure on the previous page supports AFIT reporting to the Air University Commander.

Recommendation: AFIT retain its current command arrangement reporting to Air University.

CHAPTER SIX

The Employment and Compensation of Civilian Professors at the Institute

Title 10, United States Code, Section 9314 authorizes the employment and compensation of civilian professors at AFIT. Air Force Policy Directive (AFPD) 36-8, *Employee Benefits and Entitlements*, is implemented through Air Force Instruction (AFI) 36-804; *Civilian Faculty Pay Plan for Air University and the USAF Academy* (29 April 1994)[3] and Air University (AU) Supplement 1 to AFI 36-804 (10 July 2000) governs the implementation of the faculty pay at both AFIT at Wright-Patterson AFB OH and the AU schools at Maxwell AFB AL. These instructions establish the requirements for appointment, reappointment, academic rank, tenure (if applicable), salary step adjustments, and merit awards for civilian faculty.

The Secretary of the Air Force has delegated to the Director of Personnel Force Management the authority to prescribe basic pay rates for faculty. The Faculty Pay Plan (FPP) sets pay for faculty positions based on academic rank (instructor, assistant, associate and full professor and deans or senior managers) with minimum and maximum step levels within each rank. The maximum payable rate is limited to the rate for Level III of the Executive Schedule (5 U.S.C. 5304 (g) (2)), currently capped at $133,700. This cap was not affected by the actions referenced in this report.

Due to AFIT's drawdown in the mid- to late-1990s, 20 of the graduate school's 51 civilian faculty members either retired or left to take other positions. The Department of Electrical and Computer Engineering currently has five vacancies; the Department of Aeronautics and Astronautics has three vacancies; the Department of Operational Sciences has two vacancies. The institute has had difficulty filling these positions. A competitive FPP is a crucial ingredient in the process of attracting and retaining quality faculty members.

Another difficulty that AFIT has encountered in hiring faculty is the statutory requirement that Federal degree-granting institutions hire only US citizens. Neither private graduate schools nor other public education institutions face such a restriction. As a result, AFIT and the other Federal degree-granting schools have a smaller pool of eligible applicants, particularly for faculty in the sciences, engineering, and some management disciplines. Although the data is not readily available regarding the citizenship of faculty members at non-Federal institutions, the US Department of Education and the AAUP do report the percentage of doctorates earned by US and non-US citizens each year. These are classified into broad disciplinary groups, including engineering and the physical sciences. According to data published annually by the AAUP, the percentage of doctorates awarded to non-US citizens each year in engineering and the physical sciences has been 45-60 percent for the last decade.[4]

Recommendation: Continue efforts to reduce faculty hiring shortfall

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[3] AFI 36-804 superseded Air Force Regulation (AFR) 40-533 (23 March 1990).

[4] *Source:* Annual reports on numbers of earned doctorates in the "Facts and Figures" section of the *Chronicle of Higher Education* home page, http://chronicle.com.

CHAPTER SEVEN

The Processes for the Identification of Requirements for Personnel with Advanced Degrees within the Air Force and Identification and Selection of Candidates for Annual Enrollment at the Institute

Air Force Instruction (AFI) 36-2302, *Professional Development;* Chapter , Graduate Education identifies the process to fill advanced degree requirements.

Graduate education programs are designed to manage limited resources and support National, Military, and Air Force strategic objectives in an increasingly complex international environment experiencing rapid changes in science and technology. Graduate education requirements are identified by specific position and Advanced Academic Degree (AAD) requirements to meet the overall Air Force mission. It applies to Air Force active duty line officers in the grade of lieutenant colonel and below. It does not directly apply to US Air Force Reserve and Air National Guard members.

AAD positions are the basis of the AF-funded graduate education program. A validated AAD position means the incumbent cannot optimally perform the job without the specified advanced degree. Projected vacancies due to personnel rotations or new degree requirements are the basis for AF AAD-funded quota requirements. If the AF cannot fill the mission critical positions with the current officer inventory, then a limited number of officers are selected to receive graduate education through AFIT, either by in-resident attendance at AFIT or a civilian institution. Current Air Force policy requires students to attend AFIT in-residence if the specific degree program is offered at AFIT. If the degree program is not available at AFIT, then the student will attend a civilian institution. Graduates of the program normally serve in a coded AAD position immediately following graduation to ensure optimal payback to the Air Force. However, they must serve in an AAD position no later than the second tour following completion of the funded education.

Title 10, USC Section 2005 and DoDD 1322.10, *Policy on Graduate Education for Military Officers*, permits the USAF to provide graduate education for selected positions. The Graduate Education Management System (GEMS) is the process USAF uses to fill positions which require an advanced degree. The GEMs process prioritized requirements flow from commanders through major commands (MAJCOMs), Direct Reporting Units (DRUs) or Field Operating Agencies (FOAs) to Air Staff representatives who ensure an equitable selection opportunity for all functional areas.

Annual quotas are determined by available student man-years (SMYs). SMYs are based on a manpower formula that factors the number of courses, course length and the number of student entries each year. The available annual SMYs for the period 1998-2008 are 822, down from 860 in 1997. The reduction is a direct result of the overall manpower drawdown and budget cuts over the past decade.

The total AAD authorizations across all Air Force specialties is 4,290 coded positions ranging from the grade of first lieutenant to general officers. Since 1998, annual AF Education Requirements Board (AFERB) requests have been greater than the 822 SMY quotas available. Requests typically are for

over 1,200 SMYs. Academic Specialty Monitors (ASMs), the proponents for requirements within their areas of expertise, only submit their highest priorities because of the cap on SMYs. The panel of functional experts must prioritize requirements in order to stay within the SMYs' cap. A second board meets during the year to redistribute unused quotas allocated during the initial AFERB.

AFIT administers the graduate programs and acts as the AF Registrar for all officers enrolled in advanced degree programs, including those at civilian institutions. Officers earn their degrees through resident study at AFIT, or through one of over 400 civilian institutions. PhD candidates complete their programs in an average of 4.5 years (includes time for thesis), while master's programs range from 15 to 18 months.

Each year the Deputy Chief of Staff/Personnel (AF/DP) requests that MAJCOM/DRU/FOA/DPs review all coded AAD positions. The Air Staff provides both detailed guidance and criteria to the field, as well as reviews positions through command hierarchies in close collaboration with ASMs.

Filling AFIT in-residence seats appears to be a simple process on the surface but there are numerous factors that affect the resident fill rates. These include: a "volunteer only" fill system; a shortage of academically qualified, eligible candidates in certain AFSCs (especially Science and Engineering); mission requirements, which compete for limited number of S&E officers available; lack of accessions in specific, technically orientated disciplines to send to AFIT; and limited ability of AFPC to release certain candidates to school for an extended period of time due to utilization and professional development issues. Further explanations of the identified problems are provided below:

A volunteer-only fill system: A lack of volunteers for graduate education in technical career fields is a persistent problem. Possible causes might include a combination of incurring an active duty service commitment for advanced education and lucrative job opportunities in the civilian sector for technical professionals. AFPC and AFIT continue to solicit volunteers with strong support from the Secretary of the Air Force (SECAF) and Chief of Staff of the Air Force (CSAF).

A shortage of eligible candidates in certain specialties: This is due in part to operational commitments and commanders' reluctance to release candidates to school for an extended period of time when their units are faced with critical manning shortages in that specialty. Hard-to-fill science and engineering specialties suffer from a robust economy and a more competitive civilian job market. The Dec 00 S&E Summit addressed this issue as a nationwide problem. The Office of the Under Secretary of the AF Acquisition (SAF/AQ) is currently developing the AF's S&E requirements. A follow-on summit, S&E Summit II, is scheduled for Dec 01 to discuss findings from the S&E requirements review.

Lack of academically qualified candidates: Operations tempo and reduced manning since the drawdown continue to affect the AAD program. Better advertising by AFIT to the field on timing of an application, better preparation for GRE and GMAT examinations, and preparatory courses for those requiring remedial study to better prepare for GMAT/GRE testing can help increase the qualified pool.

Mission requirements taking priority: Air Force mission requirements take priority over graduate education requirements. Limited manning dictates that operational commitments are filled first, especially in science and engineering mission areas.

Lack of officer accessions with specific degrees to send to school: This is a direct reflection of the shortage of engineers not only within the military and federal government but also in the nation as a whole.

Limited ability of AFPC to release certain candidates to school for an extended period of time due to utilization and professional development issues: AFPC, which approves an officer's release for developmental opportunity, is constrained from releasing officers for an extended period to attend graduate school because of competing requirements to support professional military education (1-yr), support professional continuing education such as Operational Space and Missile Test course, and the need to fill critical mission requirements. Until S&E manning is at required levels, we see no solution to this problem.

For FY 01, AF/DPDE has coordinated the fill process for in-resident AFIT seats closely with AFPC, AFIT, USAFA, and AU. As a result of careful monitoring and aggressive policy implementation, the FY01 incoming AFIT resident class is projected to be 210 students, including 80 logistics and acquisition students, and 130 science and engineering students. Air Staff has implemented a number of initiatives to improve and streamline the GEMS process. In addition, the S&E Summit is reviewing the student selection process.

NOTE: The Air Force Medical Service (AFMS) is not considered part of the AAD program. AFMS receives separate funding for their education and training activities. The AFMS education is not part of the in-residence graduate education program at AFIT.

In summary, the Air Force has a formal system in place to ensure limited graduate education resources provide the maximum benefit to the Air Force, Department of Defense, and the nation. The Air Force selection process to determine and fill AADs is independent of the other services and government agencies.

Recommendation: Continue to use present system to maximize opportunities at AFIT as mission requirements allow.

CHAPTER EIGHT

Post-Graduation Opportunities within the Air Force for Graduates of the Institute

As noted in Chapter 7, there are 4,290 AAD-coded positions in the Air Force. Many are filled from the existing inventory without any need for additional graduate education. However, at times the Air Force must send officers to degree programs to prepare them for AAD-required positions. This is the case for AFIT graduates. AFIT provides in-residence graduate degrees in a number of specialties. The major areas that AFIT offers in-residence degrees in are aeronautical and astronautical engineering, computer sciences, electrical and software engineering, environmental engineering, mechanical engineering, nuclear engineering, operations research, mathematics, physics, meteorology, logistics management, cost analysis, acquisition logistics management, transportation management, and contracting management.

With 4,290 AAD required coded positions, there are a number of opportunities for each graduate in the different specialties relating to their degree. The positions are generally in research and development, academic instructor duties at AFIT or the USAF Academy, or in analysis positions within the degree specialty. They are typically not in management positions. The S&E Summit is examining a scientist and engineer career path that would allow these officers to take a technical career path and be competitive for promotion to higher grades. The S&E Summit is committed to defining a better career path that will enhance recruitment and retention of scientists and engineers.

Each AAD graduate has a number of opportunities to use their graduate degree in the AF. The S&E Summit is exploring not only how to make these opportunities more appealing, but also how to enhance the entire S&E career field for better retention and recruitment of scientists and engineers. S&E Summit findings when published will provide the most up-to-date information on this subject.

Furthermore, a joint review by AFIT and NPS may result in additional opportunities for AFIT and NPS through added joint duty and cross flow assignments. It is envisioned that the alliance will enhance understanding between the institutes as to the value of each other's programs and result in additional opportunities for the graduates.

Recommendation: Review and evaluate S&E Summit findings when published.

CHAPTER NINE

The Policies and Practices Regarding the Admission to the Institute of Officers of the Army, Navy, Marine Corps, and Coast Guard; Employees of the Department of the Army, Department of the Navy, and Department of Transportation; Personnel of the Military Forces of Foreign Countries; Enlisted Members of the Armed Forces; and Other Persons Eligible for Admission

All United States Army, Navy, Marine, and Coast Guard officers are eligible to attend AFIT, as are all DoD and Department of Transportation civilian personnel and military officers from foreign countries. AFIT's mission is to educate students to develop skills needed for their future jobs.

AFIT follows largely the same admission policies and practices, including academic eligibility criteria, for applicants from sources other than the USAF. AFIT can enroll non-USAF students on a space-available basis only. Based on the AF's annual requirements for officers with advanced degrees, the AF funding for graduate education sets limits on the total number of man-years allocated for graduate degree programs. This limits the number of seats available for other students who wish to attend AFIT. AFIT leadership asserts they can efficiently produce 230 MS and 35 PhD students per year. Once the AFERB determines the number of student quotas for AFIT in each academic specialty, the Air Force Personnel Center, in conjunction with AFIT, attempts to fill quotas from the pool of applicants whom AFIT has identified as academically qualified and whose functional career fields will release them for the assignment.

The total number of these filled quotas determines the budget, personnel, and other resources the AF allocates to AFIT. As a result, the number of students AFIT can enroll each year from non-AF sources, including those from sister services, is limited by the number of vacant quota slots. Each year AFIT estimates, based on past experience, how many non-AF students it can admit the following academic year. This can lead to significant variations in the number of non-AF students AFIT can admit from year to year. In recent years, space has been available for almost all qualified applicants. This was not the case in the 1980s and early 1990s.

The AF funds AFIT based only on the number of AF quota students authorized. AFIT could accommodate additional non-USAF students if the institute received additional funding to offset the additional costs incurred.

Civilian personnel from any Federal government agency are eligible to attend AFIT either both part- or full-time--and a small number do so. AFIT is permitted to charge tuition to cover the expense of their education, but by law AFIT can retain these funds to defray its operating costs only under very specific circumstances described below. Otherwise, the AF normally transfers these funds to the general US Treasury and receives no direct benefit. There is no specific authority allowing personal checks to be deposited in an AF appropriation as payment for tuition. Without this authority, personal checks must be deposited in the Treasury (Miscellaneous Receipts Account).

AFIT may use a student's tuition to defray its operating expenses only if the student attends the institute under the provisions of the Cooperative Research and Development Agreement (CRDA) between AFIT and the Dayton Area Graduate Studies Institute (DAGSI). DAGSI is a consortium formed by Wright State University, the University of Dayton, and AFIT in 1995 to coordinate, integrate, and leverage the resources of the three schools to improve and expand graduate-level educational opportunities in engineering.[5] Through DAGSI, graduate engineering students can take scientific and technical courses at any of the member schools. The Ohio Board of Regents, the educational governing board for the State of Ohio, funds the consortium to provide scholarships for graduate engineering students at the DAGSI schools, and AFIT students are eligible for these scholarships. Under the provisions of the CRDA, non-quota AFIT students attending classes through DAGSI pay tuition to the consortium instead of directly to AFIT or to the other schools. DAGSI then reimburses the school for all courses provided. DAGSI deducts a minor administrative fee for this service. Last year DAGSI had 251 total students enrolled with 42 at AFIT and provided over $2.2M in scholarships and stipends worth over $335K.

Prior to the advent of the DAGSI, AF policy did not permit non-Federal government personnel to attend AFIT. The USAF Deputy Chief of Staff for Personnel authorized AFIT to begin accepting these students through DAGSI in 1995. Although eligibility is limited to US citizens, this program allows AFIT to recruit outstanding students to help support AF research as part of their education program. AFIT can frequently provide these students part-time employment as research assistants using specific research-support funds provided by other AF and DoD agencies.

Finally, AFIT is allowing civilians and military located in the Wright-Patterson AFB area to attend part-time as stated in Chapter 3. Approximately 40 such students have taken advantage of this program over the past year. Many of these students have obtained tuition scholarships through funding provided by the State of Ohio.

Although no USAF policy explicitly prohibits enlisted personnel from enrolling in an AFIT program in the Graduate School of Engineering and Management, all references to eligibility for Air Force-sponsored quota slots in the graduate school refer to officers only. The AF sends students to AFIT for an AAD to obtain the education for a position the graduate would fill after graduation. Because the USAF does not have enlisted positions requiring an AAD, enlisted students could not be assigned against quota slots in the graduate school. However, there is no reason why academically qualified enlisted personnel could not attend AFIT as full-time students.

As mentioned in Chapter One, the Air Force envisions a joint effort with the Navy in identifying centers of excellence between AFIT and NPS. Through these collaborative efforts to identify and develop centers of excellence, AFIT and NPS may develop common application procedures and combined curricula and graduation opportunities that will eliminate unnecessary redundancy.

Recommendation: Work student fill rates commensurate with AFIT's funding.

The Ohio State University and the University of Cincinnati have since joined the consortium as affiliate members.

CHAPTER TEN

The Near- and Long-Term Funding of the Institute

Near-Term Funding (through 2002).

During recent years, funding has remained nearly constant at AFIT, while overall requirements have increased. Mission efficiencies have helped AFIT continue its mission with minimal impact. For instance, two schools, the Graduate School of Acquisition and Systems Logistics and the Graduate School of Engineering and Management, merged to become the Graduate School of Engineering and Management. This allowed sharing of resources and reduced repetitive processes, but no future mission efficiencies are expected. AFIT is expected to run a budget shortfall in the next few years. Since 1996, overall funding has remained nearly steady while AFIT has identified additional requirements totaling $4M-8M annually. The funding from FY96 through FY01 is listed below. Approximately $30M is for military and civilian pay and over $38M is fenced for programs such as medical and environmental education. Approximately $12M is discretionary operations and maintenance (O&M) funding:

YEAR	AMOUNT ($000)
	80,739
	79,222
	81,716
	80,417
	81,999
	(Estimated) 79,900

This trend is typical of the budget cuts the services have endured. Assuming a 3-4 percent inflation rate, AFIT's budget has shrunk 4-5 percent a year.

In FY 01, AFIT has $2.77M in mission critical unfunded requirements and another $630K of mission essential and mission enhancement requirements. Mission critical is defined as "cannot start new programs or must stop current operations." Mission essential is defined as "not broken but not optimal delivery." Mission enhancement is defined as "improves quality of life; the need exists; however, there is little impact on mission acomplishment." The critical shortfalls in funding are:

ITEM	AMOUNT($000)
Critical lab equipment and supplies	1,652.7
Replacement of outdated computer systems	1,122.0

The lab equipment and supplies cited above are underfunded because the AFIT lab equipment budget was zeroed out in the early 1990s. The computer upgrades are required to support education and research activities. At the time this report was compiled these items still required funding.

The mission essential items consist of $355.1K in lab equipment and supplies, and $75.0K in audio/visual upgrades. The mission enhancement is $200.0K for modular furniture and carpet required to accommodate the Air Force Research Library merger with AFIT's Library.

At the time of this report, AFIT was seeking funding for the above items. To procure mission critical items in FY00, AFIT deferred some requirements to FY01 including computer buys, library documents and resources, and equipment replacements. AU provided $1M out of its budget to fund lab equipment in support of AFIT's accreditation review by the North Central Association of Colleges and Schools (NCA).

In FY 02, discretionary O&M funding is expected to be around $14M, while AFIT has identified over $18M in requirements, of which approximately $12M is committed to "must pay" items. AFIT prioritized over $6M in unfunded requirements to determine what would be funded. AFIT plans to fund the following items in priority order as referenced below:

ITEM	AMOUNT($000)
Lab equipment	1,250.0
Automated data processing equipment contract increases	353.0
Custodial contract increases	72.5
Copier maintenance contract	12.0
Copiers	20.0
Official Trips for Commandant to Support Official Travel	20.0
Virtual School House Contract (web-based instruction for logistics)	109.0
International Flight Safety Officer course (zeroed out of AF budget)	72.0
TOTAL	1,908.5

AFIT continues to work around these shortfalls and is functioning adequately as an institute of higher learning as evidenced by its recent NCA reaccreditation, but is constrained by budget limitations.

Long-term Funding (FY 03-09).

This section outlines the long-term operational funding required by the institute from FY 03-09 as projected in the POM cycle requirements. It is based on AFIT's anticipated budget being $80M with 3-4 percent annual increases for inflation. AFIT has identified the following deficiencies in funding from FY 03-09:

FY	AMOUNT($000)
03	11.6
04	19.9
05	13.8
06	14.1
07	14.9
08	15.4
09	15.5

Recommendation: Continue to work shortfalls in funding.

CHAPTER ELEVEN

Opportunities for Cooperation, Collaboration, and Joint Endeavors With Other Military and Civilian Scientific and Technical Educational Institutions for the Production of Qualified Personnel To Meet Department of Defense Scientific and Technical Requirements

AFIT research interests and faculty expertise cover a broad spectrum of technical areas to attack current problems and explore future systems for USAF and DoD organizations. Evidence of this focus is that 87 percent of all theses and dissertations were externally sponsored by AF, DoD, and associated government agencies. The other 13 percent were sponsored by allied armed services or concerned technology transfer ventures. AFIT has taken advantage of numerous joint and cooperative research efforts. In FYs 97-00, outside sponsorship and funding for research efforts have ranged from $3.1M to nearly $4.5M annually. DoD regulations limit AFIT's ability to charge DoD organizations. Accounting for these non-chargeable items, the cost of AFIT's research program at a comparable civilian university would have been from $8M to $9M a year. Over this time, funded research projects have exceeded 100 projects a year with over 160 master's theses and 8 doctoral dissertations produced each year.

AFIT's number one avenue for joint research is the Air Force Research Laboratory (AFRL) and the Air Force Office of Scientific Research (AFOSR), which is part of AFRL. Over the past few years, these two organizations have provided over 70 percent of the funding for joint research by AFIT as well as a number of projects. Since 1997, these two units have sponsored over $10M in joint research. The combination of location at Wright-Patterson AFB and common research focus make AFRL and AFOSR ideal research partners.

In addition to AFRL and AFOSR, other AFMC units have sponsored over $250,000 in research funding annually since FY 97. This research has been for the Aeronautical Systems Center, Air Force Flight Test Center, Space and Missile Systems Center, and miscellaneous operational units. Combining these figures with the previous paragraph, nearly 80 percent of joint research has been in cooperation with AFMC. To further future efforts, AFIT and AFMC are creating a joint advisory board to pursue opportunities.

AFIT has proactively searched for joint research opportunities throughout the AF. AFMC is not the only AF activity that AFIT has supported in research. From FYs 97-00, other AF agencies have contributed a yearly average in excess of $500,000. Agencies supported include the Space Warfare Center, Air Mobility Warfare Center, AF Civil Engineer Support Agency, AF Studies and Analyses Agency, AF Technical Applications Center, AF weather units, and the AF Communication Agency.

In addition to opportunities with the AF, AFIT has supported other DoD units but not to the extent of the joint research provided to AF units as would be expected. Other DoD-sponsored research has averaged almost $250,000 the last 4 years with typically 8 projects each year. Examples of units supported are the Defense Advanced Research Projects Agency, Defense Intelligence Agency, Defense Threat Reduction Agency, Office of the Secretary of Defense, and US Strategic Command.

AFIT has received over $300,000 for joint research in the last 4 years from government agencies outside the DoD. Agencies supported include the Department of Energy and the National Security Agency. Opportunities outside of the DoD, but within the federal government have been limited since AFIT's research, by design, is primarily defense and aerospace-focused.

Within its operating constraints, AFIT aggressively seeks opportunities for cooperation, collaboration and joint endeavors with other military and civilian scientific and technical educational institutions. However, until just recently opportunities outside of the government were considered limited. As an example, research sponsored from outside of the government was less than $100,000 annually from FYs 97 through 99 but rose to $336,772 in FY 00 of which DAGSI contributed $255,291. With the creation of DAGSI and its cooperative agreements, AFIT anticipates over $1M in FY01 for 31 projects with AFIT as the lead agency on 10 of the projects. As Chapter 9 of this report described, DAGSI is a prime example of AFIT's collaboration with other engineering schools in Ohio on both educational programs and research.

Building upon its success with DAGSI, AFIT is now working to develop similar articulation arrangements with educational institutions located throughout the country. The long-term objective is to develop stronger research and programmatic ties with institutions in other states in order to increase educational opportunities for Air Force officers and civilians in a variety of locations. Although an agreement is not yet in place, planning with the University of Tennessee Space Institute, adjacent to the US Air Force Arnold Engineering Development Center, is well underway. In addition, AFIT is partnering with 11 universities on joint endeavors. These institutes are Cal Tech, Johns Hopkins, Notre Dame, UC-Irvine, UC-Santa Barbara, U of Colorado, U of New Mexico, U of Rhode Island, VA Tech, and Youngstown State University.

These collaborative efforts, while in their infancy, are expected to grow further since AFIT and other federal institutions of higher education will now be allowed to compete for funding under the FY 02 and future DoD University Research Initiative (URI) programs. These programs include the Defense University Research Instrumentation Program (DURIP) and the Multidisciplinary University Research Initiative (MURI). This change in policy removes a substantial barrier to research activity at AFIT, and hopefully will establish a clear precedent for AFIT's eligibility to compete for other federal research funding.

One remaining difficulty is that AFIT is not presently authorized to receive grants, and therefore must negotiate other funding transfer mechanisms with sponsors. The Strom Thurmond National Defense Authorization Act for FY 99 amended Title 10 (Secs. 4358, 6977, and 9357) allows the United States Military Academy, United States Naval Academy, and United States Air Force Academy to receive grants. Similar legislation for AFIT would facilitate additional collaborative research activity especially if additional language is included to authorize AFIT to execute sole-source sub-contracts to partner universities for competitively awarded team projects (e.g., MURIs).

In short, AFIT has been heavily involved in cooperative research endeavors with other AF agencies and even with other DoD agencies but only recently have they been able to pursue opportunities outside of the federal government. The opportunities appear to be available but they must be developed. Only through a combination of joint research between agencies within the government and

in the private sector can the institute be expected to develop all of the qualified personnel who are needed to meet DoD scientific and technical requirements.

Recommendation: Work to resolve statutory restriction on receipt of grants.